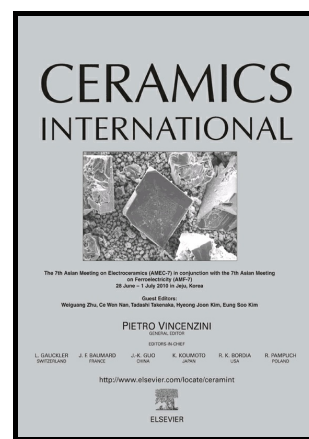


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## Tailoring the grain size of zirconia polycrystalline fibers by cetyltrimethyl ammonium bromide.

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### Abstract:

In the study, cetyltrimethyl ammonium bromide (CTAB) has been found to have a significant effect on the grain size of zirconia ( $\text{ZrO}_2$ ) polycrystalline fibers from a precursor of polyacetylacetonatozirconium (PAZ). A relation between the variation in the grain size of the fibers sintered at 1000 °C for 1 h and CTAB addition has been established by scanning electron microscopy (SEM) and matching the results by a Gaussian Function. The grain size increased firstly and then decreased at an elevated weight percent of CTAB with respect to PAZ.  $\text{ZrO}_2$  nucleation at 500 °C and grain growth during thermal treatment between 500-1000 °C were investigated by thermal analysis (TG-DTA), X-ray photoelectron spectroscopy (XPS), high resolution transmission electron microscopy (HRTEM) and X-ray diffraction (XRD). The results indicate that the addition of CTAB accelerated the decomposition of PAZ. The

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